SMAX vs SA

Posted by adehoces - 2008/10/16 12:28

Hello! I am running several simulations in KINEROS and I have a question about input data. I don't know the relation between SA (soil saturation value for the event, which I include in the .pre file) and SMAX (maximum relative saturation, in kinlut.dbf). I have realized that I in some simulations I have used a SA value which is higher than SMAX of my soil, which is not possible, and didn't get any error message. My question is the following: does KINEROS consider that the value of initial saturation is SA * SMAX (that is, the pore space available for water in that soil multiplied by the saturation value for the event) or do I have to take into account that SA has to be less than SMAX?
Thanks a lot. Kind regards,
Ana

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Re:SMAX vs SA

Posted by lainie - 2008/10/17 00:54

Hi Ana,

Although AGWA does not error trap for this situation, KINEROS does.

According to our KINEROS expert, Carl Unkrich, if the initial soil saturation SA is greater than SMAX, then G is set to zero, which is equivalent to setting SA=SMAX.

Lainie

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Re:SMAX vs SA

Posted by adehoces - 2008/10/17 11:00

Then I don't understand what's wrong with my simulations! I have set an SA value of 0.9 and SMAX is 0.81 in the whole of my basin's soil.I had previously set 0 infiltration in channels. I have run KINEROS twice using the same .pre and .par, I had only change the value of G, and I still get different higrographs!

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Re:SMAX vs SA

Posted by lainie - 2008/10/20 20:10

Changing G will result in a change in your hydrographs. Otherwise, AGWA should produce the same results if you use the same .par and .pre files.

Also, KINEROS sets SMAX at 0.95, regardless of what AGWA calculates.

Does that help?

Lainie

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Re:SMAX vs SA
Posted by adehoces - 2008/10/21 08:31

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I see, but what I don't understand about my simulations is why, having set a SA higher than SMAX, the hydrograph changes when I change only G. You said than in that case G was set to 0, regardless of its value in the .par file.
I also don't understand what you mean when you say than KINEROS sets SMAX at 0.95. What happens then with the value of SMAX in .par? Or do you mean that KINEROS sets that value when the user doesn't input another one?

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Re:SMAX vs SA
Posted by lainie - 2008/10/21 17:11

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Currently KINEROS uses 0.95 for SMAX regardless of what AGWA calculates - it is hard-coded in. So, if SA is greater than 0.95, then G is set to 0. If SA is NOT greater than 0.95, and you change only G, then your hydrograph will change.

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Re:SMAX vs SA
Posted by adehoces - 2008/10/22 10:39

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Now I can see what happens! I thought that 'smax' in .par was the smax KINEROS used for its calculations, which would be quite logical. It is a bit dangerous to make such assumptions when I try to parameterize! What other parameters are hard-coded in?

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Re:SMAX vs SA
Posted by lainie - 2008/10/22 22:06

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I'm happy to report that SMAX is the only parameter that is hard-coded in KINEROS.

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Re:SMAX vs SA

Posted by adehoces - 2008/10/27 11:42

That is great! Thanks a lot for the explanations, I was really confused.
Ana

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Re:SMAX vs SA

Posted by adehoces - 2010/02/25 11:36

Hello! Due to an event in particular I am trying to parameterize, I had to come back to this topic. I had to simulate this event considering that the soil was initially saturated, or make it saturated during the whole of the simulation, I have not decidet yet. I have run KINEROS2 twice: the first time, I made G=0 in all planes (SA was 0.65), and the second one I made SA=1 (G was 299). To my surprise, the hydrographs were not the same. Furthermore, I got more runoff in the 'SA=1' case than in the other one. I was expecting to have the same hydrograph, but I could have understood that the 'G=0' one were bigger (I think that, in this case, infiltrability is the same as saturated hydraulic conductivity during the whole event, whereas if the soil is initially saturated but rainfall falls below saturated conductivity, infiltrability can increase, am I right?). I don't understand the results I had, can you help me?
I enclose the graphic summarizing the most important input data and results.
Thanks a lot again for your help,
Ana

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Re:SMAX vs SA

Posted by adehoces - 2010/02/25 11:44

Sorry, could not attach the image file, I'm trying again!
http://www.tucson.ars.ag.gov/agwa/images/fbfiles/images/g0_sa1.JPG

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Re:SMAX vs SA

Posted by adehoces - 2010/03/03 12:58

Hello! It's me again. I'm having the same problem again with another event. I am trying to track the problem and it seems to me that, if you set G=0, something strange happens and the hydrograph is considerably reduced, instead of being increased due to permanent saturation. Could you please check that for me?
Thanks a lot in advance,
Ana

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Re:SMAX vs SA
Posted by lainie - 2010/03/03 16:19

From Carl, our KINEROS guru:

If SA > SMAX, G is set to zero. So the two cases are equivalent in that sense.

However, the code is structured such that for the case where G is zero in the parameter file, the CV parameter is not read, and is given a zero value.

So in the case where G is zero in the parameter file, the infiltration rate is steady at KS. In the case where SA > SMAX, the infiltration rate will vary somewhat from KS as a function of rainfall rate due the CV being nonzero.

Let me know if that doesn't answer your question.

Lainie

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Re:SMAX vs SA
Posted by adehoces - 2010/03/04 08:14

It answers my question perfectly, thanks a lot.
Greetings,
Ana

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Re:SMAX vs SA
Posted by adehoces - 2010/03/18 05:27

I think something strange happens when I set SA=SMAX, the hidrograph is much bigger than I expect, it must be something structured in the code again, am I right?

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Re:SMAX vs SA
Posted by lainie - 2010/03/23 15:35

SA = SMAX is treated the same as SA > SMAX, so Ks is adjusted based on rainfall rate and CV.

Hope that helps.

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Re:SMAX vs SA
Posted by adehoces - 2010/03/24 02:35

That is what I thought, but something else happens if you set SA> or = Smax, as you can see in the graph I enclose.

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Re:SMAX vs SA
Posted by adehoces - 2010/03/24 02:49

Sorry, I had problems with the picture again!

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Re:SMAX vs SA
Posted by adehoces - 2010/03/24 03:00

I hope it finally works.

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Re:SMAX vs SA
Posted by adehoces - 2010/03/24 03:09

There in no way I can send the pic properly so I have sent it to you by email. Thanks a lot for your help, Ana

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Re:SMAX vs SA
Posted by isburns - 2010/03/24 10:44

Ana,
The image was uploaded to the server, but it wasn't tagged in the message. Did you choose the option to "Select image file to attach" or the "Select file to attach"? If you choose the "Select image file to attach" and then submit the message, it should work. You don't need to add any of the image tags, they should be added automatically after the message is submitted.

Shea

http://www.tucson.ars.ag.gov/agwa/images/fbfiles/images/sa_effect_.jpg

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Re:SMAX vs SA

Posted by adehoces - 2010/03/25 04:21

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Hi, Shea. I could upload the image, but as you can see it is really bad. I changed it so it could be seen properly (size and resolution), but when I tried to upload it again, I got an error message, or I got neither an error message, nor a image! So I finally sent it to Lainie by email.
Thanks,
Ana

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